ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2019; SP7: 100-102

Dr. Sunil Kumar Gulati
MD Medicine, Metro hospital and cancer research Center Jabalpur, Madhya Pradesh, India

Correspondence
Dr. Sunil Kumar Gulati
MD Medicine, Metro hospital and cancer research Center Jabalpur, Madhya Pradesh, India

(Special Issue-7)
"International Conference on Science and Education: Problems, Solutions and Perspectives"
(3rd June, 2019)

Assessment of microalbuminuria in patients of essential hypertension

Dr. Sunil Kumar Gulati

Abstract
Background: Microalbuminuria is urinary albumin excretion seen in patients with established essential hypertension and is a predictor of higher risk of cardiovascular and renal dysfunction. The present study was conducted to assess microalbuminuria in patients of essential hypertension.
Materials & Methods: 60 patients of essential hypertension of both genders underwent detection of metabolic profile, urine evaluation, echocardiography and MA.
Results: Out of 60 patients, males were 38 and females were 22. Age group 30-40 years had 2, 40-50 years had 6 and 50-60 years had 18 case of MA. The difference was significant ($P< 0.05$). The mean SBP was 184.2 mm Hg and 152.6 mm Hg and DBP was 110.4 mm Hg and 102.6 mm Hg in MA present and MA absent patients. The difference was significant ($P< 0.05$).
Conclusion: Authors found that high prevalence of microalbuminuria in patients with essential hypertension.

Keywords: essential hypertension, microalbuminuria, urine

Introduction
Increased urinary excretion of albumin ranging between 30 and 300 mg/d (ie, microalbuminuria) has been found in a relatively large number of patients with essential hypertension [1]. Microalbuminuria (MA), defined as urinary albumin excretion (UAE) in the range of 30–300 mg/24 h, is seen in patients with established essential hypertension and is a predictor of higher risk of cardiovascular and renal dysfunction [2]. A slightly raised levels of albumin well within microalbuminuric range relates to increased cardiovascular risk, i.e., increased risk for myocardial infarction, stroke, cardiovascular death, heart failure, and peripheral vascular resistance [3]. Detection of increased UAE could be the best index of an increased global cardiovascular risk in a given patient. Variations in the prevalence of microalbuminuria between 10% and 40% that have been reported in other studies are likely due to differences in the selection criteria, to the techniques used for the detection of microalbuminuria, and, in some cases, to the small number of patients studied [4].
The pathophysiological mechanisms leading to the development of microalbuminuria are not fully understood [5]. This may be the result of altered intrarenal hemodynamics and may represent, as in insulin-dependent diabetes mellitus, an early feature of renal impairment, or it may be simply a marker of capillary leakiness at the glomerular level and thus reflect generalized atherosclerotic vascular damage [6]. The latter hypothesis is supported by several epidemiological studies that show an association between microalbuminuria and increased morbidity and mortality, especially that caused by cardiovascular disease independently of other risk factors. Recently, interest in the study of microalbuminuria has grown because it may represent a useful and relatively inexpensive clinical tool for the identification of hypertensive patients at higher risk for cardiovascular damage [7]. The present study was conducted to assess microalbuminuria in patients of essential hypertension.

Materials and Methods

The present study was conducted among 60 patients of essential hypertension of both genders. All were informed regarding the study and their consent was obtained. Inclusion criteria were essential hypertension of any grade as defined by the Seventh report of the Joint National Committee 7 (JNC 7) guidelines.

Data such as name, age, gender etc. was recorded. A thorough general physical examination was performed. All patients underwent metabolic profile, urine evaluation and echocardiography. MA, defined as UAE in range of 30–300 mg/24 hours, was measured by hemocue albumin technique. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table 1: Distribution of patients

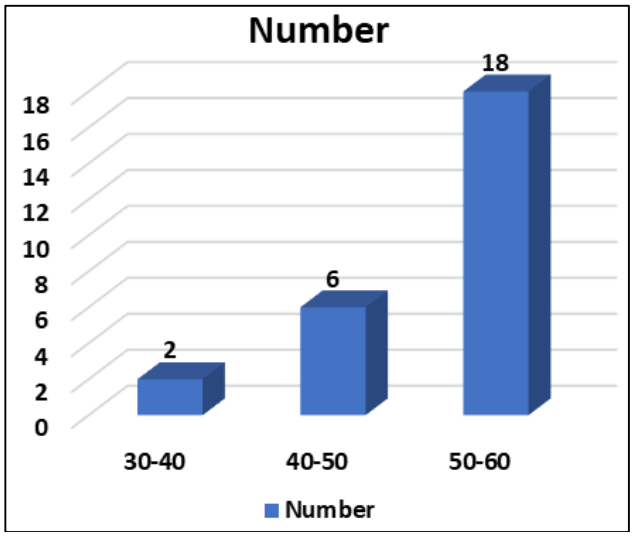
Total- 60		
Gender	**Male**	**Female**
Number	38	22

Table I shows that out of 60 patients, males were 38 and females were 22.

Table 2: Prevalence of MA and age group

Age group (Years)	Number	P value
30-40	2	0.02
40-50	6	
50-60	18	

Table II, graph I shows that age group 30-40 years had 2, 40-50 years had 6 and 50-60 years had 18 case of MA. The difference was significant (P< 0.05).



Graph 1: Prevalence of MA and age group

Table 3: Blood pressure and MA

Blood pressure (mm Hg)	MA present	MA absent	P value
SBP	184.2	152.6	0.02
DBP	110.4	102.6	0.05

Table III shows that mean SBP was 184.2 mm Hg and 152.6 mm Hg and DBP was 110.4 mm Hg and 102.6 mm Hg in MA present and MA absent patients. The difference was significant (P< 0.05).

Discussion

Hypertension is a disorder of circulatory regulation. Sustained hypertension causes accelerated atherosclerosis with consequent coronary heart disease (CHD), heart failure, and stroke and renal failure.[8] If untreated, approximately 50% of patients develop heart disease, 33% develop stroke, and 10%–15% develop renal failure.[9,10] Agewall *et al.* [11] reported an ≈23% prevalence of microalbuminuria in a population of hypertensive patients who were selected as at high risk for cardiovascular disease. Age and race seem to exert a significant influence on urinary albumin excretion and may account for some of the variability reported in the literature. The present study was conducted to assess microalbuminuria in patients of essential hypertension.

In present study, out of 60 patients, males were 38 and females were 22. We found that age group 30-40 years had 2, 40-50 years had 6 and 50-60 years had 18 case of MA. Jalal *et al.* [12] in their study of relationship between MA and cardiac structural change in mild hypertensive patients found significant correlation between UAE and cardiac structural parameters such as IVS (r = 0.71), PSVT (r = 0.64), and LVM (r = 0.65). Those who had MA presented higher values of all cardiac parameters. These data indicate that MA in essential hypertension represents an early marker of cardiac structural abnormalities.

We found that mean SBP was 184.2 mm Hg and 152.6 mm Hg and DBP was 110.4 mm Hg and 102.6 mm Hg in MA present and MA absent patients. Recently, a large clinical trial that involved patients with mild and moderate essential hypertension showed a 6.1% prevalence of microalbuminuria, which is a considerably lower value than previously reported [13].

Maggon *et al.* [14]. in their study 50 treatment-naïve hypertensive patients (16–80 years of age) were prospectively enrolled. MA (defined as urinary albumin excretion in the range of 30–300 mg/24 h) was present in 44% of patients with newly detected essential hypertension. A significant number of patients with MA had abnormally high mean left ventricular mass index as compared to those without MA. In addition, a positive correlation was also observed between MA and LVH. Furthermore, mean CCIMT was found to be higher in patients with MA (P < 0.001), with 69.2% of the patients with MA having elevated mean CCIMT. The CCIMT had a positive correlation with both MA and LVH. This study demonstrates the presence of MA in a significant number of newly detected and untreated patients of essential hypertension. Further, MA had a statistically significant relationship with LVH and CCIMT.

Pontremoli *et al.* [15] included 787 untreated patients with essential hypertension. Albuminuria was measured as the albumin-to-creatinine ratio in three non-consecutive, first morning urine samples. The prevalence of microalbuminuria was 6.7%. Albuminuric patients were more likely to be men and to be characterized by higher blood pressure, body mass index, and uric acid levels and lower HDL cholesterol and HDL cholesterol−to−LDL cholesterol ratio. Piecewise linear regression analysis demonstrated that uric acid and diastolic blood pressure significantly influence albuminuria and together account for a large part of its variations. K-means cluster analysis performed on the entire cohort of patients confirmed that microalbuminuria is associated with a worse cardiovascular risk profile. Furthermore, microalbuminuria was associated with the presence of target organ damage

(eg, electrocardiographic [ECG] abnormalities and retinal vascular changes). Age and the presence of microalbuminuria act as independent risk factors for the development of ECG abnormalities and retinal vascular changes. Cluster analysis allowed us to identify three subgroups of patients who differed in the presence or absence of microalbuminuria, retinopathy, and ECG abnormalities.

Conclusion

Authors found that high prevalence of microalbuminuria in patients with essential hypertension.

References

1. Hitha B, Pappachan JM, Pillai HB, Sujathan P, Ramakrishna CD, Jayaprakash K, *et al.* Microalbuminuria in patients with essential hypertension and its relationship to target organ damage: An Indian experience. Saudi J Kidney Dis Transpl 2008;19:411-9.
2. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr, *et al.* The seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure: The JNC 7 report. JAMA 2003;289:2560-72.
3. Devereux RB, Alonso DR, Lutas EM, Gottlieb GJ, Campo E, Sachs I, *et al.* Echocardiographic assessment of left ventricular hypertrophy: Comparison to necropsy findings. Am J Cardiol 1986;57:450-8.
4. Levy D, Savage DD, Garrison RJ, Anderson KM, Kannel WB, Castelli WP. Echocardiographic criteria for left ventricular hypertrophy: The Framingham Heart Study. Am J Cardiol 1987;59:956-60.
5. Carroll BA, Johnson AM. The Extracranial Cerebral Vessels; In Diagnostic Ultrasound, 3rd edition. Rumack CM, Wilson SR, Charboneau JW, Johnson JA, eds. Philadelphia, PA; Elsevier Mosby 2005;1:943-87
6. Fisher ND, Williams GH. Hypertensive vascular disease. In: Kasper DL, Braunwald E, Fauci A, Hauser S, Longo D, Jameson JL, editors. Harrison's Principles of Internal Medicine. 16th ed. United States of America; McGraw-Hill Medical Publishing Division 2005, p. 1463-80.
7. Tagle R, Acevedo M, Vidt DG. Microalbuminuria: Is it a valid predictor of cardiovascular risk? Cleve Clin J Med 2003;70:255-61.
8. Parving HH, Mogensen CE, Jensen HA, Evrin PE. Increased urinary albumin-excretion rate in benign essential hypertension. Lancet 1974;1:1190-2.
9. Bigazzi R, Bianchi S, Campese VM, Baldari G. Prevalence of microalbuminuria in a large population of patients with mild to moderate essential hypertension. Nephron 1992;61:94-7.
10. Kasliwal RR, Bansal M, Desai N, Kotak B, Raza A, Vasnawala H, *et al*. A Study to derive distribution of carotid intima media thickness and to determine its COrrelation with cardiovascular Risk factors in asymptomatic nationwide Indian population (SCORE-India). Indian Heart J 2016;68:821-7.
11. Agewall S, Persson B, Samuelsson O, Ljungman S, Herlitz H, Fagerberg B. Microalbuminuria in treated hypertensive men at high risk of coronary disease: the Risk Factor Intervention Study Group. **J** Hypertens 1993;11:461-469.
12. Jalal S, Sofi FA, Alai MS, Sidiqui MA, Bhat MA, Khan KA, *et al*. Prevalence of microalbuminuria in essential hypertension: A study of patients with mild to moderate hypertension. Indian J Nephrol 2001;11:6-11.
13. Kasliwal RR, Bansal M, Bhargava K, Gupta H, Tandon S, Agrawal V. Carotid intima-media thickness and brachial-ankle pulse wave velocity in patients with and without coronary artery disease. Indian Heart J 2004;56:117-22.
14. Maggon RR, Malik R, Jain N, Isser HS. Study of the Prevalence of Microalbuminuria in Patients of Essential Hypertension and its Correlation with Left Ventricular Hypertrophy and Carotid Artery Intima-media Thickness. J Clin Prev Cardiol 2018;7:11-6.
15. Pontremoli R, Sofia A, Ravera M, Nicolella C, Viazzi F, Tirotta A, *et al*. Prevalence and clinical correlates of microalbuminuria in essential hypertension: the MAGIC study. Hypertension 1997;30(5):1135-43.